

## REMARKS

### I. STATUS OF THE CLAIMS

None of the claims have been amended herein. In view of the above, it is respectfully submitted that claims 1-20 are pending. No new matter is presented and entry and reconsideration are respectfully requested.

### II. THE REJECTION OF CLAIMS 1-10 AND 18-20 UNDER 35 U.S.C. §112, FIRST PARAGRAPH

Claims 1-10 and 18-20 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement.

Applicants respectfully submit that claims 1-10 and 18-20 are enabled by the specification and therefore fully comply with the requirements of 35 U.S.C. § 112, first paragraph.

Claim 1 recites, " wherein a setting of said pre-emphasis in said pre-emphasis performing means is made after controlling a setting of an  $\alpha$  parameter representing an amount of the optical wavelength chirp in said chirp applying means."

Claim 10 recites " wherein the setting of said pre-emphasis is made after controlling the setting of the  $\alpha$  parameter representing an amount of the optical wavelength chirp."

Claim 18 recites " wherein the pre-emphasis setting in said pre-emphasis performing unit is made after the  $\alpha$  parameter setting."

Claim 20 recites " wherein the pre-emphasis setting is made after the  $\alpha$  parameter setting representing the amount of the optical wavelength chirp."

These recitations are supported by the specification, at least at page 10, lines 9-29, which recites that the parameter  $\alpha$  can be changed and is adjustable depending on a control signal transmitted from the control section, and that the variable optical attenuator 41E functions as a pre-emphasis performing means. Furthermore as illustrated at FIG. 2 element 41C which sets the  $\alpha$  parameter is located before element 41E which sets the pre-emphasis. Accordingly, FIG. 2 and the specification provide proper support for the recited language of setting the pre-emphasis after setting the  $\alpha$  parameter.

Further support for the recitations in these claims can be found in the specification at least at page 16, line 29 through page 17, line 7. This portion of the specification teaches that for the control algorithm, for example, when the BER is obtained by the optical receiver, firstly the PMD compensation among of the variable PMD compensator 42B of the optical received is adjusted and feedback controlled such that the BER value to be measured is optimized.

Accordingly, Applicants respectfully submit that the rejection under 35 U.S.C. § 112 first paragraph of claims 1-10 and 18-20 is improper and should be withdrawn.

### III. THE REJECTION OF CLAIMS 11-15 UNDER 35 U.S.C. §112, FIRST PARAGRAPH

Claims 11-15 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement.

Applicants respectfully submit that claims 11-15 are enabled by the specification and therefore fully comply with the requirements of 35 U.S.C. § 112, first paragraph.

Claim 11 recites "said control means of said transmitting terminal station and said Raman amplification control means of said optical repeater station control the setting of pre-emphasis in said pre-emphasis performing means after controlling the supply condition of Raman excitation light in said Raman amplifier."

These recitations are supported by the specification, at least at page 10, lines 9-29, which recites that the parameter  $\alpha$  can be changed and is adjustable depending on a control signal transmitted from the control section, and the variable optical attenuator 41E functions as a pre-emphasis performing means. Further support for these recitations can be found at least at figures 5 and 8, elements 21', 75 and 71.

Further support for these recitations can be found in the specification, at least, at page 33, line 8 through page 34 line 30 of the specification. This portion of the specification teaches that the control algorithm, after controlling a supply condition of Raman excitation light source depending on the control signal, and storing the Raman amplifier control value are terminated, controls the setting of the pre-emphasis and stores the pre-emphasis amount.

### IV. THE REJECTION OF CLAIM 17 UNDER 35 U.S.C. §112, FIRST PARAGRAPH

Claim 17 stands rejected under 35 U.S.C. § 112, first paragraph as failing to comply with

the written description requirement.

Applicants respectfully submit that claim 17 is enabled by the specification and therefore fully complies with the requirements of 35 U.S.C. § 112, first paragraph.

Claim 17 recites "wherein a setting of the pre-emphasis in said pre-emphasis performing means is after controlling a setting of an  $\alpha$  parameter representing an amount of the optical wavelength chirp in said chirp applying means."

These recitations are supported by the specification, at least at page 10, lines 9-29, which recites that the parameter  $\alpha$  can be changed and is adjustable depending on a control signal transmitted from the control section, and the variable optical attenuator 41E functions as a pre-emphasis performing means. Further support for these recitations can be found at FIG. 2, elements 41C, 41D and 41E.

V. THE REJECTION OF CLAIMS 1-3, 8-10 AND 18-20 UNDER 35 U.S.C. §103(a), AS BEING UNPATENTENABLE OVER TERAHARA IN VIEW OF SWANSON, SATOH AND PIERRE

Applicants respectfully traverse this rejection for at least the following reasons.

Independent claim 1 recites, amongst other novel elements, "a **setting** of said **pre-emphasis** in said pre-emphasis performing means is made **after** controlling a **setting** of an  $\alpha$  **parameter** representing an amount of the optical wavelength chirp in said chirp applying means."

Independent claim 10 recites, amongst other novel elements, "wherein the **setting** of said **pre-emphasis** is made **after** controlling the **setting** of the  $\alpha$  **parameter** representing an amount of the optical wavelength chirp."

Independent claim 18 recites, amongst other novel elements, " wherein the **pre-emphasis setting** in said pre-emphasis performing unit is made **after** the  $\alpha$  **parameter setting**."

Independent claim 20 recites, amongst other novel elements, " wherein the **pre-emphasis setting** is made **after** the  $\alpha$  **parameter setting** representing the amount of the optical wavelength chirp."

Accordingly, independent claims 1, 10, 18 and 20 recite setting the pre-emphasis **after** the  $\alpha$  parameter. By setting the pre-emphasis after the  $\alpha$  parameter, as recited in independent

claims 1, 10, 18 and 20, it's possible to obtain optimized transmission characteristics by making the control in such a sequence that at first, an optimizing point of waveform is obtained by controlling the section of the  $\alpha$  parameter, and then the noise over the signal waveform is equalized for each wavelength by the pre-emphasis.

The Office Action recognizes that neither Terahara, nor Swanson, nor Satoh teach or suggest an iterative optimization sequence for applying chirp control and pre-emphasis control and relies upon Pierre for such a teaching.

Pierre discloses an iterative technique having a dynamic programming phase and a strategy phase which "by alternating between strategy phases and dynamic programming phases, better and better solutions are obtained, and these, hopefully but not necessarily, converge to the optimal solution" (section 7-10, lines 5-7 and 12-15).

Accordingly, Pierre fails to teach or suggest setting the pre-emphasis **after** the  $\alpha$  parameter as recited in independent claims 1, 10, 18 and 20.

Accordingly, Applicants respectfully submit that there is no motivation to combine in either reference and only through hindsight would one be motivated to modify Terahara, Swanson, Satoh and Pierre to meet the limitations of the claims.

The Office Action also fails to address the feature of setting the pre-emphasis after the  $\alpha$  parameter and simply indicates that adjusting the setting of  $\alpha$  parameter first and then adjusting the setting or pre-emphasis would have been obvious to one of ordinary skill in the art until some optimization criteria has been achieved, as taught by Pierre (page 6 of the Office Action).

However, as noted above, Pierre fails to teach or suggest any feature regarding the setting the pre-emphasis **after** the  $\alpha$  parameter as recited in independent claims 1, 10, 18 and 20.

Accordingly, Applicants respectfully submit that there is no motivation to combine either reference.

Accordingly, Applicants respectfully submit that the rejection of independent claims 1, 10, 18 and 20 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Pierre, whether taken singly or combined teach or suggest each feature of independent claims 1, 10, 18 and 20.

Furthermore, Applicants respectfully assert that dependent claims 2, 3, 8 and 9 are

allowable at least because of their dependence from claim 1, and dependent claim 19 is allowable at least because of its dependence from claim 18, and the reasons set forth above.

VI. THE REJECTION OF CLAIM 4 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND PIERRE AND FURTHER IN VIEW OF TAGA

Claim 4 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh nor Pierre, whether taken singly or combined teach or suggest the features recited in independent claim 1.

Taga discloses a wavelength division multiplexed (WDM) optical communication method and apparatus using a pre-emphasis technique to adjust the attenuation or amplification of a particular optical channel at a transmitter terminal to produce identical signal-to-noise ratios for all of the optical channels at a receiver terminal (abstract).

Accordingly, Taga also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 4 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Pierre, nor Taga, whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 4 depends from.

VII. THE REJECTION OF CLAIM 5 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND PIERRE AND FURTHER IN VIEW OF KHALEGHI

Claim 5 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh nor Pierre, whether taken singly or combined teach or suggest the features recited in independent claim 1.

Khaleghi discloses a method and apparatus for channel performance equalization in wavelength division multiplexed (WDM) systems, where performance of the channels is estimated from optical power measurements of each signal transmitted by the channels (abstract).

Accordingly, Khaleghi also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 4 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Pierre nor Khaleghi whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 5 depends from.

VIII. THE REJECTION OF CLAIM 6 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND PIERRE AND FURTHER IN VIEW OF EGGLETON

Claim 6 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh nor Pierre, whether taken singly or combined teach or suggest the features recited in independent claim 1.

Eggleton discloses an optical communication system having one or more automatic dispersion compensation modules, each module having an adjustable dispersion element, a data integrity monitor and a feedback network whereby the monitor adjust the dispersion element to optimize system performance (abstract).

Accordingly, Eggleton also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 6 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Pierre nor Eggleton whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 6 depends from.

IX. THE REJECTION OF CLAIM 7 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA, SWANSON, SATOH AND PIERRE AND FURTHER IN VIEW OF EGGLETON AND BULOW.

Claim 7 depends upon independent claim 1, and as noted above, neither Terahara, nor Swanson nor Satoh nor Pierre nor Eggleton, whether taken singly or combined teach or suggest the features recited in independent claim 1.

Bulow discloses an electrical equalizing facility for an electric input signal derived from an optical signal transmitted over an optical fiber that is distorted due to interference in the optical signal as a result of polarization (abstract).

Accordingly, Bulow also fails to teach or suggest, amongst other novel features of claim 1, setting the pre-emphasis after setting the  $\alpha$  parameter.

Therefore, Applicants respectfully assert that the rejection of claim 7 under 35 U.S.C. §103(a) should be withdrawn because neither Terahara nor Swanson nor Satoh nor Pierre nor Eggleton nor Bulow whether taken singly or combined teach or suggest each feature of independent claim 1, upon which claim 7 depends from.

X. THE REJECTION OF CLAIMS 11-14 and 16 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA IN VIEW OF SWANSON, FORD, STEPHENS AND PIERRE

Applicants respectfully traverse this rejection for at least the following reasons.

Independent claim 11 recites amongst other novel elements "said control means of said transmitting terminal station and said Raman amplification control means of said optical repeater station control the **setting of pre-emphasis** in said pre-emphasis performing means **after controlling** the supply condition of Raman **excitation light** in said Raman amplifier. "

Independent claim 16 recites, amongst other novel features, "in said optical repeater station, depending on the reception information about each wavelength transmitted from said transmitting terminal station, a supply condition of Raman excitation light for Raman amplifying the wavelength division multiplexed signal light transmitted through said optical transmission path is controlled, and in said transmitting terminal station, depending on the reception information about each wavelength transmitted from said receiving terminal station, a setting of pre-emphasis to be performed on the wavelength division multiplexed signal light transmitted through said optical transmission path is controlled."

Neither Terahara, nor Swanson, nor Ford nor Stephens disclose setting the pre-emphasis after controlling the supply condition of Raman excitation light, as recited in independent claim 11 nor controlling a supply condition of Raman excitation light for Raman amplifying the wavelength division multiplexed signal light and controlling pre-emphasis setting to be performed on the wavelength division multiplexed signal light, as recited in independent

claim 16.

Pierre also fails to teach or suggest the novel features recited in independent claims 11 and 16.

Accordingly, Applicants respectfully submit that the rejection of independent claims 11 and 16 under 35 U.S.C. §103(a) be withdrawn because neither Terahara nor Swanson nor Ford, nor Stephens nor Pierre whether taken singly or combined teach or suggest each feature of independent claims 11 and 16.

Furthermore, Applicants respectfully assert that dependent claims 12-14 are allowable at least because of their dependence from claim 11, and the reasons set forth above.

XI. THE REJECTION OF CLAIM 17 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER TERAHARA IN VIEW OF SWANSON ET AL., SATOH, STEPHENS AND PIERRE

Applicants respectfully traverse this rejection for at least the following reasons.

Independent claim 17 recites amongst other novel elements "wherein a **setting** of the **pre-emphasis** in said pre-emphasis performing means is **after** controlling a **setting** of an  $\alpha$  **parameter** representing an amount of the optical wavelength chirp in said chirp applying means."

As noted above, neither Terahara, nor Swanson, nor Satoh nor Stephens nor Pierre teach or suggest setting the pre-emphasis after setting the  $\alpha$  parameter, as recited in independent claim 17.

Accordingly, Applicants respectfully submit that the rejection of independent claim 17 under 35 U.S.C. §103(a) be withdrawn because neither Terahara nor Swanson nor Satoh, nor Stephens whether taken singly or combined teach or suggest each feature of independent claim 17.

XII. CONCLUSION

In accordance with the foregoing, it is respectfully submitted that all outstanding rejections have been overcome and/or rendered moot. And further, that all pending claims



patentably distinguish over the prior art. There being no further outstanding rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

At a minimum, the Board should enter this Amendment at least for purposes of Appeal as it either clarifies and/or narrows the issues for consideration.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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